Testing the effectiveness of nest-boxes in the conservation of woodland birds: Lake Naivasha nest-box project, Kenya

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La destruction de la forêt claire autour du Lac Naivasha, Kénya, a réduit le nombre de sites de nidification pour les espèces cavernicoles. Afin d'améliorer le succès de reproduction de ces espèces, le Projet Nichoirs du Lac Naivasha a été mis en œuvre. Une approche similaire a été couronnée de succès ailleurs. En mai 1999, 45 nichoirs en bois—39 petits (1.500 cm^3) et six grands (17.340 cm^3)—ont été placés, à 6–8 m de hauteur, dans des arbres aux alentours du Elsamere Conservation Centre et du Fisherman's Camp. Une campagne de sensibilisation, soulignant la valeur de la forêt claire, a été lancée en même temps. Trois écoles ont reçu de la documentation sur la protection de la nature et ont été impliquées dans le placement des nichoirs. Des exposés sur la protection des oiseaux ont également été présentées dans les écoles cibles. Des affiches ont été placées à des endroits stratégiques afin de sensibiliser le public. Avec l'aide de guides ornithologiques résidents, les nichoirs sont suivis de façon permanente. À la fin octobre 2000, au moins quatre espèces d'oiseaux avaient inspecté les nichoirs, mais il n'y avait pas encore eu de tentative d'occupation.

Introduction

Lake Naivasha is well known for its rich and diverse birdlife. The lake is c100 km north-west of Nairobi, in Rift Valley Province. It is a Ramsar site and an Important Bird Area (IBA)[1]. Several national parks and wildlife sanctuaries are situated around or near the lake. Its southern part is largely surrounded by tall woodland (c20 m), dominated by Yellow-barked Acacia *Acacia xanthophloea*, with a narrow papyrus fringe near the lake. The northern part has a broader papyrus fringe, with lower scrub (c2–3 m high) inland. The lake environment is threatened by human activities, chiefly horticulture and deforestation, with substantial ecological changes already reported[3,4]. Community action and support for nature conservation could prove indispensable in the protection of birds and habitats.

Project aims

Some bird species, eg barbets and hoopoes, use cavities in tree trunks, earth banks or walls for nesting and roosting. These cavities can be natural or artificial. Artificial nest-boxes have proved a valuable conservation and educational tool in many parts of the world[2], but their use is currently limited in Kenya. The Naivasha area is one of the very few examples where several farms have erected nest-boxes, though the exercise is purely out of casual interest by a handful of people.

Destruction of woodlands around Lake Naivasha has greatly diminished potential breeding sites for hole-nesting birds such as woodpeckers, barbets and hornbills. This project aimed (i) to use nest-boxes to create extra nest sites for such hole-nesting bird species, and (ii) generate community awareness of, and involvement in, bird conservation. The goals are to improve the breeding success of hole-nesting species and invoke a positive attitude towards the conservation of birds and habitats.

Methods and progress

The project commenced in May 1999 and was designed to last for 18 months. Here I present a summary of the developments thus far and anticipated work still to be undertaken.

Study sites

Forty-five boxes were erected during May 1999 at two sites. Twenty boxes—15 small and five large—were sited at Elsamere Field Study Centre in riparian woodland dominated by *Acacia xanthophloea*. The centre is adjacent to the lake, c20 km from Naivasha town and is a base for environmental research, education and training around Naivasha.

Another 25 boxes (24 small and one large) were erected at Fisherman's Camp. This is a resort, c3 km from Elsamere Study Centre, also by the lake, which is frequented by tourists and birdwatchers. The habitat is reasonably undisturbed, being well grassed and wooded compared to the surroundings. Many bird species, especially insectivores, take advantage of this area.

Box preparation

Two sizes of box were constructed: one small, measuring 10 cm x 10 cm x 15 cm and one large, 17 cm x 17 cm x 60 cm. Both were treated externally with oil to prolong their life and prevent ants, termites, rats, snakes and bees from predating any occupants[2]. Entry holes were all at least 3.75 cm from the hinged roof, thereby leaving a substantial depth below it. Hole diameter of the smaller boxes was 3.75 cm (targeted at smaller birds, eg woodpeckers and barbets) and 6.25 cm for larger boxes (for hornbills). But hole diameters were also constructed to the smallest size feasible to avoid predation by African Harrier Hawk *Polyboroides typus*, which has long legs and can easily take eggs or nestling from boxes with large holes. Hornbills typically seal their nest-holes to a minimum following egg laying, making this less of a problem. Moreover, the preservative used, being dark, enhanced the boxes camouflage.

Setting up nest boxes

Boxes at Elsamere were 6–8 m above ground, while those at Fisherman's Camp were usually higher (above 8 m) due to the availability of a taller ladder. Boxes were often placed facing away from the lake, in order to shield the entrance from winds that regularly blow from the latter, and to provide some shelter from sun and rain. Based on the growth of green moss, it was possible to determine where rainwater mainly ran down the trunk, making it possible to assess those trees and which side best suited placement of the nest-box.

Monitoring the boxes

I checked each box for breeding activity at least once every two days over the three-month period (June–August 1999) that I was permanently stationed in Naivasha, observations being made at the two sites on consecutive days. I used binoculars to observe any activity around the boxes from a hide c15 m distant from the relevant tree, for at least 15–20 minutes per box. After August 1999, I visited either once or twice a month, checking all boxes on each visit. Since January 2000, boatmen-cum-bird guides at both study sites have unsystematically checked the boxes for any signs of breeding activity.

Results at Elsamere demonstrate that several bird species showed some interest in the boxes, peering into them from outside and occasionally entering. However, none as yet has occupied any of the boxes. Species observed investigating boxes include White-headed Barbet *Lybius leucocephalus*, Nubian Woodpecker *Campethera nubica*, White-bellied Tit *Parus albiventris* and White-eyed Slaty Flycatcher *Melaenornis fischeri*.

At Fisherman's Camp, Green Wood-Hoopoe *Phoeniculus purpureus* appeared to show greater interest in the nest-boxes, carrying nesting materials into them. But, such activity continued only for one week in June and then ceased. Subsequent monitoring did not reveal any occupancy suggesting ongoing breeding, and no active nests or egg-laying activities were observed. As at Elsamere, no box has been occupied.

Information is generally scarce concerning the breeding seasons of these bird species, with most perhaps nesting almost year-round[5–7]. Most probably the lack of interest in the boxes was related to the birds being unfamiliar with such structures, rather than a lack of interest in breeding. Future monitoring work should clarify this.

Community awareness work

I visited two primary schools, two high schools and the local community, giving talks concerning the project and bird conservation in general. In addition, I issued books and magazines dealing with environmental conservation issues. Wildlife Clubs at the primary schools showed some interest, visiting the study sites with me and freely assisting my work, especially siting the boxes. Furthermore, they informed the local community about the project and its importance in environmental conservation. The children's enthusiasm for the project resulted in a number of adults questioning me as to how they could construct their own nest-box, and what measures they could take to curb (and possibly reverse) woodland destruction. Lastly, I erected ten posters, with relevant information concerning the project, its aims and detailing local conservation problems, at conspicuous places around the study sites and public market places.

Future work and monitoring

Each nest-box has been accorded a number that will make for easy and accurate monitoring in future. Observations are scheduled to continue for at least nine months. All activities by any bird species in or around the boxes will be recorded. If any breeding occurs, detailed observations will be undertaken to ascertain fledging success. I will also continue to survey other areas, educate people about birds and it is hoped enhance awareness of conservation issues affecting birds specifically in Naivasha where cavities or nest-trees are scarce.

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